

Amendments In the Claims

Please cancel Claims 8, 9, 22, 23, 37, and 38. Please add Claims 55-62. Please amend Claims 1, 5, 6, 15, 19, 20, 29, 30, 34, 35, 44, 48, and 49 as follows:

1. **(Currently Amended)** A method for a data communications system, the method comprising:
transmitting data in a transport overhead field to at least one network element, the data providing a source identifier and a destination identifier; and
processing using the data in the transport overhead field to provide **virtual path** end-to-end services, **wherein**
said processing is performed by a route processor.
2. (Original) The method of claim 1 wherein the transport overhead field is a J1 field in a SONET communication packet.
3. (Original) The method of claim 2 wherein the J1 field includes the source identifier and the destination identifier.
4. (Original) The method of claim 1 further comprising:
applying a routing protocol to read the source identifier and the destination identifier.
5. **(Currently Amended)** The method of claim 1 wherein the **virtual path** end-to-end services include one or more of routing, provisioning and restoration of functions.
6. **(Currently Amended)** The method of claim 1 wherein the **virtual path** end-to-end services are path-level services of a SONET communications network.
7. (Original) The method of claim 1 wherein the method is performed in a communication circuit disposed in one of a synchronous optical network (SONET) and a Synchronous Digital Hierarchy (SDH).

8-9. **(Canceled)**

10. (Original) The method of claim 1 wherein the data further includes one or more of

transport identification data (TID),
Internet Protocol (IP) addresses,
Common Language Location Information (CLLI) data, and
requests for bandwidth.

11. (Original) The method of claim 1 wherein the data providing the source identifier and the destination identifier avoid manual point-by-point routing of STS-Ns.

12. (Original) The method of claim 1 further comprising:
applying a wavelength routing protocol to the data in the transport overhead field to
provide end-to-end services,
the wavelength protocol locating new paths for communication.

13. (Original) The method of claim 12 wherein an intelligent routing software system in combination with the wavelength routing protocol determines end-to-end routing automatically.

14. (Original) The method of claim 12 wherein the wavelength protocol locating new paths for communication is implemented manually.

15. (Currently Amended) An apparatus disposed in a communication system, the apparatus comprising:
means for transmitting data in a transport overhead field to at least one network element, the data providing a source identifier and a destination identifier; and
a route processor means for **processing using** the data in the transport overhead field to provide **virtual path** end-to-end services.

16. (Original) The apparatus of claim 15 wherein the transport overhead field is a J1 field in a SONET communication packet.

17. (Original) The apparatus of claim 16 wherein the J1 field includes the source identifier and the destination identifier.

18. (Original) The apparatus of claim 15 further comprising:
means for applying a routing protocol to read the source identifier and the destination identifier.

19. (Currently Amended) The apparatus of claim 15 wherein the virtual path end-to-end services include one or more of routing, provisioning and restoration of functions.

20. (Currently Amended) The apparatus of claim 15 wherein the virtual path end-to-end services are path-level services of a SONET communications network.

21. (Original) The apparatus of claim 15 wherein the apparatus includes a communication circuit disposed in one of a synchronous optical network (SONET) and a Synchronous Digital Hierarchy (SDH).

22-23. (Canceled)

24. (Original) The apparatus of claim 15 wherein the data further includes one or more of
transport identification data (TID),
Internet Protocol (IP) addresses,
Common Language Location Information (CLLI) data, and
requests for bandwidth.

25. (Original) The apparatus of claim 15 wherein the data providing the source identifier and the destination identifier avoids manual point-by-point routing of STS-Ns.

26. (Original) The apparatus of claim 15 further comprising:
means for applying a wavelength routing protocol to the data in the transport overhead field to provide end-to-end services,
the wavelength protocol locating new paths for communication.
27. (Original) The apparatus of claim 26 wherein an intelligent routing software system in combination with the wavelength routing protocol determines end-to-end routing automatically.
28. (Original) The apparatus of claim 26 wherein the wavelength protocol locates new paths for communication manually.
29. (Currently Amended) A computer program product for communication, the computer program product comprising:
signal bearing media bearing programming adapted to
a first set of instructions, executable on a processor, configured to transmit data in a transport overhead field to at least one network element, the data providing a source identifier and a destination identifier; and
a second set of instructions, executable on a router processor, configured to use the data in the transport overhead field to provide **virtual path** end-to-end services.
30. (Currently Amended) A method for a data communications system, the method comprising:
receiving data in a transport overhead field by at least one network element, the data providing a source identifier and a destination identifier; and
processing using the data in the transport overhead field to provide **virtual path** end-to-end services, **wherein**
said processing is performed by a route processor.

31. (Previously Presented) The method of claim 30 wherein the transport overhead field is a J1 field in a SONET communication packet.

32. (Previously Presented) The method of claim 31 wherein the J1 field includes the source identifier and the destination identifier.

33. (Previously Presented) The method of claim 30 further comprising:
applying a routing protocol to read the source identifier and the destination identifier.

34. (Currently Amended) The method of claim 30 wherein the virtual path end-to-end services include one or more of routing, provisioning and restoration of functions.

35. (Currently Amended) The method of claim 30 wherein the virtual path end-to-end services are path-level services of a SONET communications network.

36. (Previously Presented) The method of claim 30 wherein
the method is performed in a communication circuit disposed in one of a synchronous optical network (SONET) and a Synchronous Digital Hierarchy (SDH).

37-38. (Canceled)

39. (Previously Presented) The method of claim 30 wherein the data further includes one or more of
transport identification data (TID),
Internet Protocol (IP) addresses,
Common Language Location Information (CLLI) data, and
requests for bandwidth.

40. (Previously Presented) The method of claim 30 wherein the data providing the source identifier and the destination identifier avoid manual point-by-point routing of STS-Ns.

41. (Previously Presented) The method of claim 30 further comprising:
applying a wavelength routing protocol to the data in the transport overhead field to
provide end-to-end services,
the wavelength protocol locating new paths for communication.
42. (Previously Presented) The method of claim 41 wherein an intelligent routing
software system in combination with the wavelength routing protocol determines end-to-end
routing automatically.
43. (Previously Presented) The method of claim 41 wherein the wavelength
protocol locating new paths for communication is implemented manually.
44. (Currently Amended) An apparatus disposed in a communication system,
the apparatus comprising:
a receiver network element configured to receive data in a transport overhead field
from at least one transmitting network element,
the data providing a source identifier and a destination identifier; and,
a route processor configured to process wherein the receiver uses the data in the
transport overhead field to provide virtual path end-to-end services.
45. (Previously Presented) The apparatus of claim 44 wherein the transport
overhead field is a J1 field in a SONET communication packet.
46. (Previously Presented) The apparatus of claim 45 wherein the J1 field
includes the source identifier and the destination identifier.
47. (Previously Presented) The apparatus of claim 44 wherein the receiver
applies a routing protocol to read the source identifier and the destination identifier.

48. (Currently Amended) The apparatus of claim 44 wherein the virtual path end-to-end services include one or more of
routing,
provisioning, and
restoration of functions.

49. (Currently Amended) The apparatus of claim 44 wherein the virtual path end-to-end services are path-level services of a SONET communications network.

50. (Previously Presented) The apparatus of claim 44 wherein the data further includes one or more of
transport identification data (TID),
Internet Protocol (IP) addresses,
Common Language Location Information (CLLI) data, and
requests for bandwidth.

51. (Previously Presented) The apparatus of claim 44 wherein the data providing the source identifier and the destination identifier avoids manual point-by-point routing of STS-Ns.

52. (Previously Presented) The apparatus of claim 44 further comprising:
means for applying a wavelength routing protocol to the data in the transport overhead field to provide end-to-end services,
the wavelength protocol locating new paths for communication.

53. (Previously Presented) The apparatus of claim 52 wherein
an intelligent routing software system in combination with the wavelength routing protocol determines end-to-end routing automatically.

54. (Previously Presented) The apparatus of claim 52 wherein the wavelength protocol locates new paths for communication manually.

55. (New) The method of Claim 1 wherein said processing comprises:
interpreting a failure indication from a network element in a failed virtual path;
calculating a new virtual path to replace the failed virtual path; and
providing an indication of the new virtual path to an affected network element.

56. (New) The method of Claim 1 wherein said processing comprises:
calculating a virtual path from a network element corresponding to the source
identifier to a network element corresponding to the destination identifier.

57. (New) The method of Claim 15 wherein said means for processing
comprises:
means for interpreting a failure indication from a network element in a failed virtual
path;
means for calculating a new virtual path to replace the failed virtual path; and
means for providing an indication of the new virtual path to an affected network
element.

58. (New) The method of Claim 15 wherein said means for processing
comprises:
means for calculating a virtual path from a network element corresponding to the
source identifier to a network element corresponding to the destination
identifier.

59. (New) The method of Claim 30 wherein said processing comprises:
interpreting a failure indication from a network element in a failed virtual path;
calculating a new virtual path to replace the failed virtual path; and
providing an indication of the new virtual path to an affected network element.

60. (New) The method of Claim 30 wherein said processing comprises:
calculating a virtual path from a network element corresponding to the source
identifier to a network element corresponding to the destination identifier.

61. (New) The apparatus of Claim 44 wherein the route processor is further
configured to:

interpret a failure indication from a network element in a failed virtual path;

calculate a new virtual path to replace the failed virtual path; and
provide an indication of the new virtual path to an affected network element.

62. (New) The apparatus of Claim 44 wherein the route processor is further configured to:

calculate a virtual path from a network element corresponding to the source identifier
to a network element corresponding to the destination identifier.